

# Trace–Impedance Matching at Junctions of Multi–Load Signal Traces to Eliminate Termination

## Abstract

A module board has trace impedances that are matched at trace junctions. An input line that drives a signal to a junction has its impedance adjusted to match the equivalent impedance of branch traces output from the junction. Since input and output impedances match, reflections caused by the junction are minimized or eliminated. The input impedance can match by being within 20% of the equivalent impedance of the branch lines. The equivalent impedance of branches is the reciprocal of the sum of the individual branch lines' reciprocal impedance. Termination can be eliminated when such junctions are impedance–matched. Secondary junctions can also be impedance–matched, allowing for a variety of trace topologies. Such trace–impedance matching is especially useful for memory modules.